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An annotated list of *Symmachia* Hübner, [1819] (Lepidoptera: Riodinidae: Symmachiini) from Parque Nacional da Serra do Divisor, Acre, Brazil, with the description of a new species

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An annotated list of *Symmachia* Hübner, [1819] (Lepidoptera: Riodinidae: Symmachiini) from Parque Nacional da Serra do Divisor, Acre, Brazil, with the description of a new species

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Abstract. We provide an illustrated list of species belonging to the genus *Symmachia* Hübner, [1819] (Lepidoptera: Riodinidae: Symmachiini) collected during an expedition conducted between September 10-21, 2011 in the northern part of the Parque Nacional da Serra do Divisor, Acre, Brazil, a remote region of Amazon rainforest. A total of 46 individuals were collected belonging to 15 species. For all recorded species, drawings of male genitalia and behavioral information are provided to support future studies on the taxonomy of the group. A new species, *Symmachia divisora* Dolibaina and Leite, **sp. nov.**, is described, and a revised status for *Symmachia hetaerina hesione* Stichel, 1910, **stat. rev.**, is proposed.

Key words. Amazon rainforest, *Symmachia divisora*, *Symmachia hetaerina hesione*, hilltopping, taxonomy.

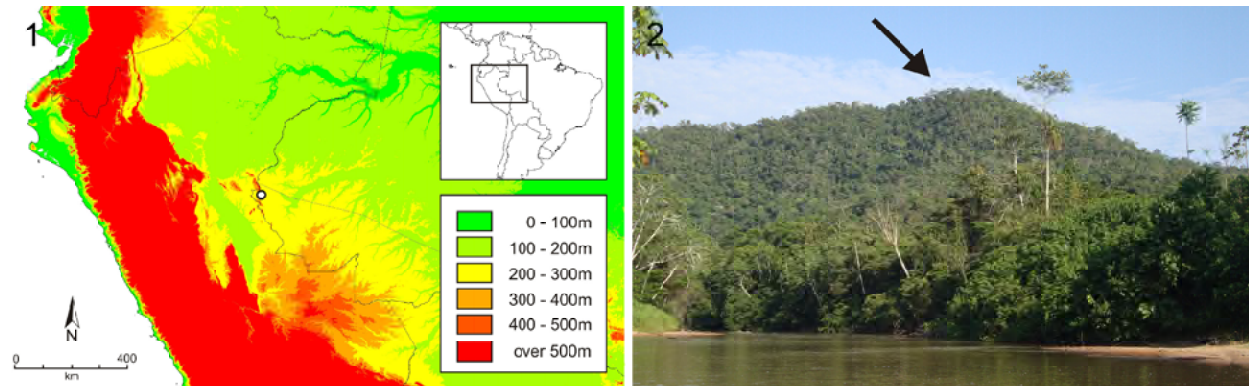
Resumo. Fornecemos a lista ilustrada das espécies pertencentes ao gênero *Symmachia* Hübner, [1819] (Lepidoptera: Riodinidae: Symmachiini) coletadas durante uma expedição entre os dias 10-21 de setembro de 2011 na porção norte do Parque Nacional da Serra do Divisor, Acre, Brasil, uma remota região de Floresta Amazônica. Ao total foram coletados 46 indivíduos pertencentes a 15 espécies. Para todas as espécies registradas são fornecidos desenhos da genitália masculina e informações de comportamento, com a finalidade de subsidiar futuros trabalhos sobre a taxonomia do grupo. Uma nova espécie, *Symmachia divisora* Dolibaina and Leite, **sp. nov.**, é descrita, assim como é proposto um status revalidado para *Symmachia hetaerina hesione* Stichel, 1910, **stat. rev.**

Palavras chave. Floresta Amazônica, *Symmachia divisora*, *Symmachia hetaerina hesione*, topos de morros, taxonomia.

Introduction

Symmachia Hübner, [1819] (Lepidoptera: Riodinidae: Symmachiini) is a neotropical genus with 58 species (Callaghan and Lamas 2004; Gallard 2008), the largest genus within the tribe Symmachiini (Hall and Willmott 1996). This tribe is defined by the presence of unique concealed androconial scales on the anterior margins of the abdominal tergites 4-7 in males, non-homologous with similar structures in other riodinid genera, such as *Menander* Hemming, 1939 (Harvey 1987; Hall and Harvey 2002). Due to many recent descriptions Symmachiini is becoming one of the best studied tribes in the subfamily Riodininae (Hall and Lamas 2007). Nevertheless, most genera within the Symmachiini are still poorly defined (Hall and Willmott 1996) and there is no phylogenetic hypothesis for the tribe or any of its genera.

No unique, universal synapomorphies are known for *Symmachia*, but two characters are often found within the genus: the presence of concealed androconial scales on tergites 4 and 5, or only on tergite 5 (Hall and Harvey 2002), and forewing with sinuous costal margin (Gallard 2008). Nevertheless, *Symmachia* is highly heterogeneous and several generic lineages probably will be recognized after a comprehensive revision and phylogenetic analysis (Hall and Willmott 1996; Hall and Lamas 2007). In addition to some taxonomic changes, several new taxa have been recently described in *Symmachia* (Salazar and Constantino 1993; Hall and Willmott 1996; Brévignon and Gallard 1998; Hall and Harvey 2007; Hall and Lamas 2007; Gallard 2008). Most of the newly described species are inhabitants of montane and premontane forests throughout the Andes, yielding an unexpectedly high riodinid diversity in these environments (Hall and Willmott 1998).



Figures 1-2. Collection site of *Symmachia* at PNSD, Acre, Brazil. **1)** Map showing the location of the collection site in the northern portion of the PNSD, Acre, Brazil. **2)** Hill located behind the housing for researchers of the PNSD indicating the exact collection site of the *Symmachia* species.

The Parque Nacional da Serra do Divisor (PNSD), located along the Brazilian-Peruvian border in the northwest of the state of Acre, Brazil, is one of the largest protected areas in Brazil, containing about 843,000 ha. The ridges of Serra do Divisor are the highest elevations within the southwest region of the Brazilian Amazon rainforest, with heights up to 600m, and are the origin of most affluents of the Juruá River basin. The vegetation in the sampled area is characterized as submontane dense ombrophilous forest (Brasil 1977). Considering recent records in similar environments in the foothills of the Andes, a high riordinid diversity might be expected in Parque Nacional da Serra do Divisor. This assumption is further supported by previous studies with other groups of invertebrates (Brown 1977, 1991; Vaz-de-Mello 1999). Thus, the purposes of this paper are to list the species of *Symmachia* collected in Parque Nacional da Serra do Divisor, Acre, Brazil, and to describe a new species, *Symmachia divisora* Dolibaina and Leite, **sp. nov.**

Material and Methods

Collections of the genus *Symmachia* were made by DRD during an expedition conducted in the northern part of the Parque Nacional da Serra do Divisor (PNSD, Fig. 1), municipality of Mâncio Lima, northwest Acre, Brazil, between September 10-21, 2011. All individuals were captured with an insect net with a five meters-long handle on the hilltop located behind the housing for researchers at PNSD (Fig. 2) (7°26'50"S 73°39'52"W). The access to the collection site was made in part by a trail leading to the park observatory and, from this point on, a new trail to access the hilltop was opened. On the hilltop was a small clearing formed by an old, restricted fire, about five meters in diameter surrounded by small trees up to seven meters high. All specimens are deposited in the Coleção Entomológica Padre Jesus Santiago Moure of the Zoology Department at the Universidade Federal do Paraná, Curitiba, Paraná, Brazil (**DZUP**).

Results

A total of 46 specimens were collected belonging to 15 species of *Symmachia*, representing almost entirely males (n=44), with the exception of two females of *S. tricolor* Hewitson, 1867. All collections were made while the individuals exhibited hilltopping behavior (*sensu* Shields 1967). Among these specimens, a new species was found and is described here. Brief behavioral comments for the other species and a proposal for the revalidation for *Symmachia hetaerina hesione* Stichel, 1910 **stat. rev.**, is given.

Symmachia divisora Dolibaina and Leite, **sp. nov.** (Fig. 3-6, 41)

Description. Male: HEAD: Frontoclypeus predominantly black, with sparse orange scales laterally that converge ventrally toward center. Eyes glabrous and brown. White coloration between lower margin

of eyes and subgena. Antenna reaching height of semi-translucent spot located in R_3 - R_{4+5} in the forewing, base black with sparse orange scales, dorsally black antennomeres with white base ventrally, last flagellomere with orange coloration. Palp approximately half length of frontoclypeus, ventrally gray and dorsally with yellowish-brown coloration. THORAX: Patagia with black and orange scales. Thorax predominantly black including tegula and region of scuto-scutellar suture II with orange scales. Legs black, ventral base of femur with light yellow coloration and meso- and metathoracic tarsus yellowish-brown. ABDOMEN:

Black from dorsal portion of tergum I to dorsoposterior margin of tergum III, forming a subtriangular spot; orange on dorsal and lateral remainder of abdomen. Sternum light yellow with black intersegmental and medium-longitudinal portions. WINGS: Forewing: Length 13.5mm (HT), 12.9mm (PT). Costa strongly convex in basal third. *Dorsal surface*: Metallic blue from base to first quarter of discal cell and from this point on with dark green coloration and metallic reflection. Costal and outer margins with a narrow black band, except for a small white extension in initial portion of costal curvature. Anterior margin of base of vein 2A with white coloration. Semi-translucent subtriangular yellow spot located from costal margin to M_3 , bordering end of discal cell. Three small spots distal to discal spot, forming a discontinuous convex line approximately parallel to it, first in R_2 - R_3 oval shaped, second rectangular at origin of R_{4+5} and M_1 and last slender in M_2 - M_3 . Small semi-translucent white spot parallel to costal margin in R_3 - R_{4+5} and another spot, with same color and size of last one, parallel to outer margin in M_2 - M_3 . *Ventral surface*: metallic blue between costal margin and Sc from wing bases to discal spot. Dark green along costal margin from discal spot until end of R_{4+5} . Remainder of wing dark gray, paler from vein 2A to anal margin. Two spots, anteriorly golden and posteriorly gray, in discal cell, first near base and second in center; two dark gray bands in CuA_2 -2A at same height of discal cell. Semi-translucent spots as described for dorsal surface, but more conspicuous on ventral surface and, with further three small white spots, first in R_{4+5} - M_1 , second in M_1 - M_2 and last one in M_3 - CuA_1 . Hindwing: Triangular with slightly produced tornus. *Dorsal surface*: Space between costal margin and Sc+ R_1 with gray coloration; black between basal portion of discal cell and half of 2A; gray in space after 3A; remainder of wing dark green with metallic reflection, except for black band along distal margin, wider in its tornal third; black fringe. *Ventral surface*: Dark gray with numerous light yellow spots distributed as follows: three in space Sc+ R_1 -Rs; one in Rs- M_1 ; one in M_1 - M_2 ; one in M_2 - M_3 ; three inside discal cell: one over dci; one in M_3 - CuA_1 ; two in CuA_1 - CuA_2 and three in CuA_2 and half of space in 2A-3A. Anal angle with a black semicircle in CuA_2 -2A, bordered basally by a light yellow band. End of veins M_3 and CuA_1 light yellow. MALE GENITALIA: Paratype (Fig. 41) (n=1) with narrow and subrectangular tegumen conspicuously separated from uncus by weakly sclerotized tissue, tegumen with a slight posterior dorsomedial projection and setae distributed irregularly on its posterior half. Gnathos articulated to tegumen at antero-dorsal edge, with shorter, irregularly rounded dorsal projection and longer ventral projection, latter slender, slightly curved and parallel at posterior tip to medium-longitudinal axis of genitalia. Anterior projection of saccus approximately same length as gnathos. Triangular valve with numerous marginal setae, articulated to ventral half of arm of saccus. Aedeagus cylindrical, anterior portion with larger diameter, gradually narrowing posteriorly and bifid at tip in lateral view.

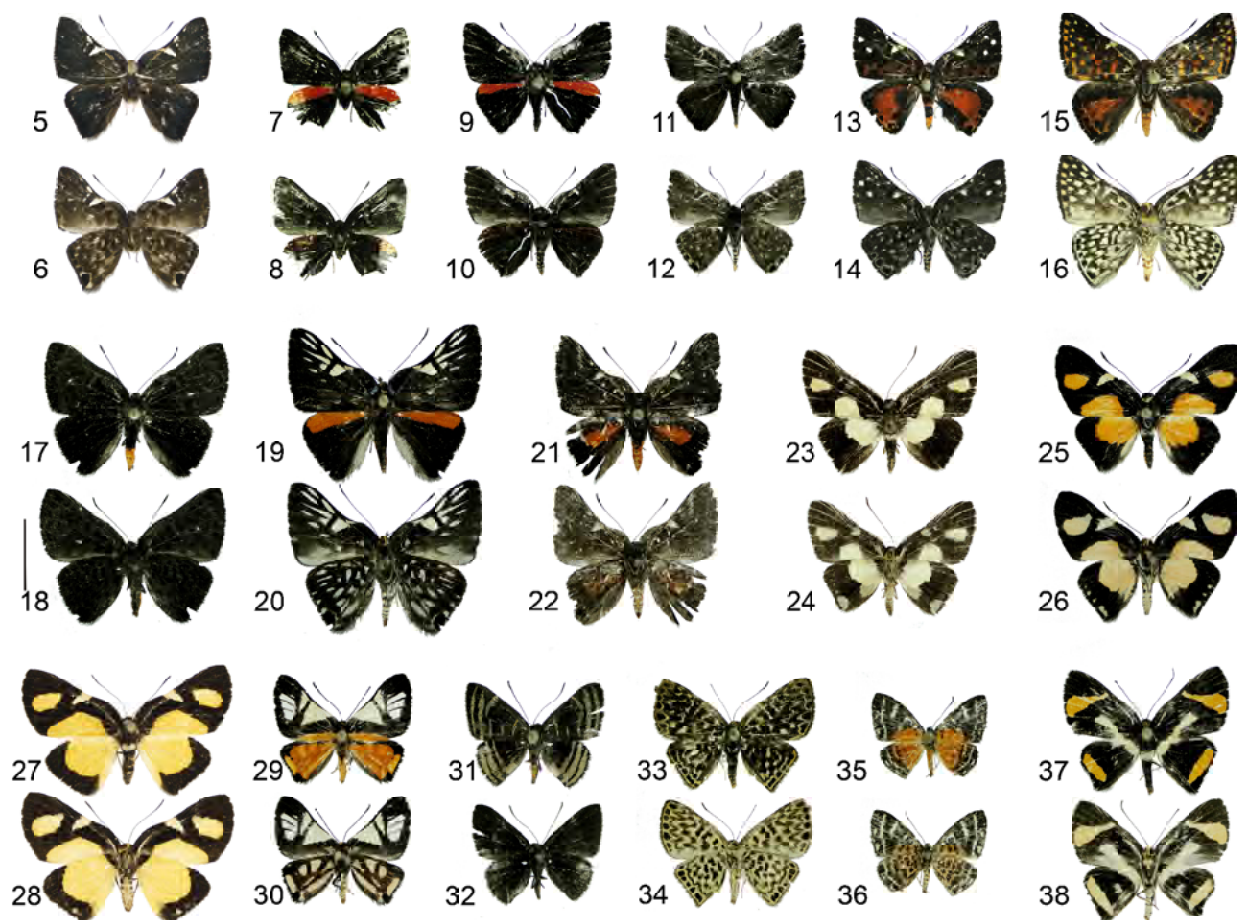
Female. UNKNOWN.

Types. Holotype male with the following labels: /HOLOTYPE/ BRASIL, ACRE, MÂNCIO LIMA, P[ar]Q[ue]. NAC[ional]. [da] SERRA DO DIVISOR, PORÇÃO NORTE, 7°26'50"S 73°39'52"W 200-400m 10-21.IX.2011 D. Dolibaina and D. Moura, leg./ DZ 23.294/ HOLOTYPE *Symphachia divisora* Dolibaina and Leite, det. 2012/ (deposited at DZUP).

Paratype: 1 male, /PARATYPE/ same data as Holotype/ DZ 21.406/ GEN[itália]. PREP[arada] LEITE 2011/ (deposited at DZUP).



Figures 3-4. Holotype male of *Symphachia divisora* sp. nov. 3) Dorsal view. 4) Ventral view. Scale line: 1 cm.



Figures 5-38. *Symmachia* species collected at PNSD (dorsal and ventral view for each species). **5-6)** *S. divisora* **sp. nov.**, Paratype. **7-8)** *S. probetor*. **9-10)** *S. estellina*. **11-12)** *S. falcistriga falcistriga*. **13-14)** *S. leena punctata*. **15-16)** *S. calliste*. **17-18)** *S. pardalis*. **19-20)** *S. accusatrix*. **21-22)** *S. threissa seducta*. **23-24)** *S. hetaerina hetaerina* (Diamantino, Mato Grosso, Brazil). **25-26)** *S. hetaerina hesione*. **27-28)** *S. hetaerina hesione*, female (Senador Guimard, Acre, Brazil). **29-30)** *S. miron miron*. **31-32)** *S. emeralda*. **33-34)** *S. calligrapha*. **35-36)** *S. elinas*. **37-38)** *S. tricolor*. Scale line: 1cm.

Etymology. The species name refers to the type locality, Parque Nacional da Serra do Divisor, Acre, Brazil.

Diagnosis and Discussion. *Symmachia divisora* is apparently a member of a small group of species that includes *S. probetor* (Stoll, 1782), *S. estellina* Gallard, 2008, *S. falcistriga falcistriga* Stichel, 1910 and *S. falcistriga meyi* Brévignon, 1998, all occurring in the Amazon rainforest and characterized by their small size, sexual dimorphism, and by the color pattern of the adults (Fig. 3-12). The new species resembles *S. falcistriga* by the pattern of the spots on both sides of the wings (Fig. 3-6, 11-12), as well as the general structures of the genitalia (Fig. 41-44). *Symmachia divisora* is easily distinguished from the species previously mentioned by its larger size, more strongly produced hindwing tornus, the shape and size of the ventral hindwing tornal spot, the presence of orange scales on the patagia and scuto-scutellar suture II and the orange coloration of the dorsal abdomen. The male genitalia differs in size and shape of the tegumen, uncus, gnathos, combined ventral projection of the tegumen and dorsal part of the saccus, anterior projection of the saccus, valve and aedeagus (Fig. 41-44).

The pattern of the spots along the outer margin of the ventral hindwing is especially relevant to pair males and females and to distinguish among females of *S. falcistriga*, *S. probetor* and *S. estellina* (Gallard 2008). This pattern is conspicuously different in the male of *S. divisora* (Fig. 4). Furthermore, the female of related species are of the same size or smaller than the male. Therefore, the female of *S. divisora*,

although unknown, is expected to be larger than females of related species and with a pattern similar to *S. falcistriga* but, as in related species, with a distinct pattern on the outer margin of the hindwing matching the pattern found on the male. Stichel (1914) described *S. cribrellum* Stichel, 1914, currently a synonym of *S. f. falcistriga* (Callaghan and Lamas 2004), from a single female from Mapiri, Bolivia; the type specimen was illustrated by Warren et al. (2012). The wing pattern of the female of *S. cribrellum* is identical to the female of *S. falcistriga meyi* illustrated by Gallard (2008) and a female examined by us, and thus this female does not represent *S. divisora*.



Figures 39-40. Forewing of *S. probetor* and *S. estellina*. **39)** *S. probetor* (Santo Antônio do Tauá, Pará, Brazil). **40)** *S. estellina* (Montagne des Chevaux, Route de Cayenne à Régina, French Guiana). Scale line: 0.25cm.

Ethology. Only two males were collected, at 10:30h on the third day of sampling, both resting with wings open on the abaxial surface of the leaves of a Lauraceae tree, roughly three meters above the ground. The species engaged in apparent territorial disputes with *S. f. falcistriga*, in which individuals flew up vertically together to about five meters above the ground. On the five subsequent days in which the type locality was visited no further individuals of *S. divisora* were observed.

Distribution. This species is currently known only from the mountains of the type locality, northwest of Acre, on the border between Brazil and Peru, and from Cerro Lumbaqui, Sucumbíos, Ecuador (0°1.42'N 77°19'W, 800-950m) (J. Hall, personal communication).

***Symmachia probetor* (Stoll, 1782)**

(Fig. 7-8, 39, 42)

A single damaged male was collected at the hilltop at 14:00h flying about five meters from the ground and apparently competing for territory with *S. estellina* Gallard, 2008 in a small patch of sun. The time of sampling differs from records mentioned by Gallard (2008) for this species in French Guiana.

Although superficially similar, there are a number of characteristics of the wing shape, pattern, and male genitalia that seem to distinguish *S. probetor* and *S. estellina*: the forewing of *S. probetor* is rounded at the apex and convex at the outer margin and there is no white or translucent spots close to the curve of the costal margin, which is weakly developed when compared to *S. estellina* (Fig. 39-40). These characteristics can be observed in the type illustration of *S. probetor* given by Stoll (1782). The male genitalia of *S. probetor* is generally larger, the saccus is shorter and the posterior margin of the tegumen is more projected and bilobed medially in dorsal view. Perhaps most conspicuously, the cornuti are undeveloped in *S. probetor* (Fig. 42) but developed in *S. estellina* (Fig. 43) (*S. probetor*, n=2; *S. estellina*, n=6).

We think there is possibly a complex of several similar looking species lumped under *S. probetor*, with some of the recognized subspecies and synonyms perhaps corresponding to valid species, in addition to the possibility of undescribed taxa.

***Symmachia estellina* Gallard, 2008**

(Fig. 9-10, 40, 43)

Two males were collected on the same day apparently competing for territory in a small patch of sun with *S. probetor*, and were not observed on subsequent days. The determination of the species was made by comparison with the work of Gallard (2008), who described the taxon based on specimens from French Guiana, although Gallard did not illustrate male genitalia in the description. Given that the Serra do Divisor and French Guiana are both part of the Amazonian biogeographic region it seems likely that these specimens from the two localities are conspecific. The characteristic shape and pattern of the forewing and the male genitalia, above cited to distinguish this species from *S. probetor*, seem to be surprisingly stable in a series of 17 males and 21 females studied by Gallard (2008) and 6 males and 3

females available to us for study at DZUP. Additionally, after the examination of large series of specimens of both *S. estellina* and *S. probetor*, Gallard (2008) did not find a single intermediate specimens between these two sympatric species.

***Symmachia falcistriga falcistriga* Stichel, 1910**

(Fig. 11-12, 44)

Only two specimens were collected at the hilltop at 10:30h while resting with open wings on the abaxial surface in the leaves of a Lauraceae tree. The two males were also seen engaging in an apparent territorial dispute with *S. divisora* (see under that species).

***Symmachia leena punctata* Butler, 1877**

(Fig. 13-14, 45)

A single exemplar was collected around 13:00h at the hilltop while resting on the abaxial surface of the leaves of a small tree in a patch of sun around two meters from the ground.

***Symmachia calliste* Hewitson, 1867**

(Fig. 15-16, 46)

This was the second most abundant species of the genus at PNSD during the collection trip, totaling seven collected individuals. All of them were captured around 13:00h in bright sunshine, while patrolling a small clearing at the hilltop or when they were resting on the adaxial surface of the leaves in trees about four meters above the ground.

***Symmachia pardalis* Hewitson, 1867**

(Fig. 17-18, 47)

Three individuals were collected while they were competing for territory near a dead tree located on the hilltop about six meters above the ground at 15:00h. All individuals presented the behavior of landing on the trunk of this tree with open wings, as recorded by Brévignon and Gallard (1998), Gallard (2008) and mentioned by Hall and Willmott (2007).

***Symmachia accusatrix* Westwood, 1851**

(Fig. 19-20, 48)

Five individuals were collected in a small clearing at the hilltop at 11:00h, flying one meter above the ground. Some individuals were sampled when they landed on the adaxial surface of the leaves in small trees of the forest understory, while others perched on dry branches close to the ground.

***Symmachia threissa seducta* Brévignon, 1998**

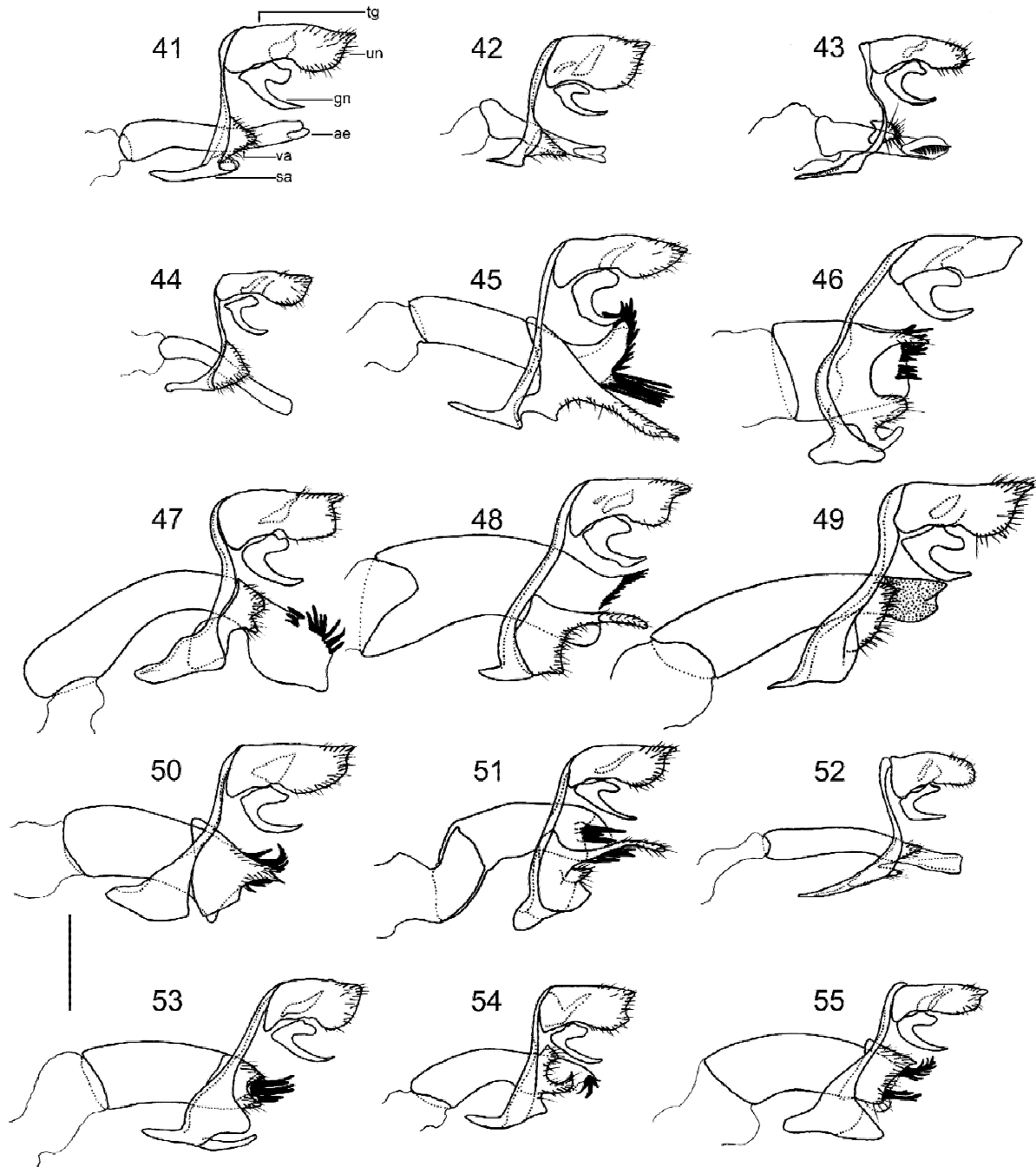
(Fig. 21-22, 49)

A single individual was collected at 11:30h at the hilltop while resting on the adaxial surface of the leaves in a small tree in a patch of sun about five meters above the ground.

***Symmachia hetaerina hesione* Stichel, 1910, stat. rev.**

(Fig. 25-28, 50)

Symmachia hetaerina Hewitson, 1867 was described based on a female from the state of Pará, Brazil. Stichel (1910) described *S. hesione* as a valid species, based on a male from the municipality of Fonte Boa, Amazonas, Brazil, and subsequently placed it as a subspecies of *S. hetaerina* (Stichel 1911), but the two names were synonymized by Callaghan and Lamas (2004). We have examined specimens from Pará, Acre and Mato Grosso (Brazil) and found the two phenotypes to be consistently different (see below) and



Figures 41-55. Male genitalia of *Symmachia* species collected at PNSD (in lateral view). 41) *S. divisora* **sp. nov.**, Paratype. 42) *S. probetor*. 43) *S. estellina*. 44) *S. falcistriga falcistriga*. 45) *S. leena punctata*. 46) *S. calliste*. 47) *S. pardalis*. 48) *S. accusatrix*. 49) *S. threissa seducta*. 50) *S. hetaerina hesione*. 51) *S. miron miron*. 52) *S. emeralda*. 53) *S. calligrapha*. 54) *S. elinas*. 55) *S. tricolor*. Abbreviation for general structures of the genitalia: **ae**: aedeagus; **gn**: gnathos; **sa**: saccus; **tg**: tegumen; **un**: uncus; **va**: valve. Scale line: 1mm.

confined to distinct geographic regions. Since the male genitalia vary greatly among species of *Symmachia*, and there are only slight differences between the male genitalia of the two taxa, and we have not found them to be sympatric, we believe that the two taxa probably correspond to the same species, in a conservative approach. We therefore remove *S. hesione* from synonymy with *S. hetaerina* and place it again as a subspecies of that species: *Symmachia hetaerina hesione* Stichel, 1910, **stat. rev.** (Fig. 25-26). *Symmachia*

hetaerina hetaerina occurs in the southern and eastern portion of Amazonia and *S. hetaerina hesione* occurs in the middle-west portion of Amazonia.

The following male wing pattern characters serve to diagnose the two taxa. **Forewing: dorsal surface** – a) small costal sub-triangular spot with pale yellow coloration located after the costal curvature, anteriorly limited by the costal margin and posteriorly reaching 2/3 of the discal cell's final width, present in *S. haeterina hesione* (Fig. 25) and absent in *S. h. hetaerina* (Fig. 23); b) marginal sub-rectangular orange spot, bigger in *S. hetaerina hesione* (Fig. 25) anteriorly reaching M_2 and posteriorly reaching half of the space in CuA_1 - CuA_2 , smaller and pale white in *S. h. hetaerina* (Fig. 23); c) posterior median spot, orange in *S. hetaerina hesione* (Fig. 25), occupying 3/5 of the anal margin while half the width and pale white in *S. h. hetaerina* (Fig. 23). **Ventral surface** – d) costal spot begins on the costal margin and reaches 2/3 of the final width of the discal cell in *S. hetaerina hesione* (Fig. 26) while smaller and not beginning on the costal margin in *S. hetaerina hetaerina* (Fig. 24); e) small spot that posteriorly borders the basal portion of Sc smaller in *S. hetaerina hesione* (Fig. 26); other spots as mentioned for the dorsal surface, but pale orange in *S. hetaerina hesione* (Fig. 26). **Hindwing: dorsal surface** – f) orange median spot 1.5 times larger in *S. hetaerina hesione* (Fig. 25) while smaller and pale white in *S. h. hetaerina* (Fig. 23); g) whitish yellow marking along the anal margin of *S. haeterina hesione*. **Ventral surface** – h) median spot limited to M_3 in *S. hetaerina hesione* (Fig. 25) while reaching the anal margin in *S. h. hetaerina* (Fig. 23) and h) marginal spot in cell CuA_2 -2A around three times larger in *S. h. hetaerina* (Fig. 23).

The females have more elongate wings than the males in both subspecies, with wing pattern resembling that of the respective male. The female of *S. h. hetaerina* has markings of the same color as the male, while *S. hetaerina hesione* differs by having yellow spots instead of orange (Fig. 27-28).

This species was the most common *Symmachia* at PNSD, with eight captured individuals, all of them flying fast and landing on the adaxial surface of the leaves of small trees, about three meters above the ground after 14:00h.

***Symmachia miron miron* Grose-Smith, 1898**
(Fig. 29-30, 51)

A single specimen was collected in flight at 14:00h, four meters above the ground in a small clearing at the hilltop. The phenotype appears to be intermediate between the nominate subspecies described from Ecuador and the subspecies *S. miron pulchellita* Brévignon and Gallard, 1992 described from French Guiana. More material from PNSD and other Amazonian localities is needed to confirm the taxonomic status for this intermediate phenotype.

***Symmachia emeralda* Hall and Willmott, 2007**
(Fig. 31-32, 52)

Three individuals were captured at the hilltop on the same day at 10:00h, while landing on the abaxial surface of the leaves in small trees about four meters above the ground. An exchange of "perches" among individuals was observed, with perches located about three meters from one another.

***Symmachia calligrapha* Hewitson, 1867**
(Fig. 33-34, 53)

Two male of this species were captured on the hilltop at 13:00h, when they were apparently fighting while flying in spiral manoeuvres about 2.5 meters above the ground.

***Symmachia elinas* (Rebillard, 1958)**
(Fig. 35-36, 54)

This is the smallest species of *Symmachia* found at PNSD, and two individuals were captured at 14:00h while flying with other species of Riodinidae belonging to the genus *Argyrogrammana* Strand, 1932 and *Theope* Doubleday, 1847 in a small patch of sun on the hilltop, two meters above the ground.

Table 1. Richness of *Symmachia* species in published lists from west Amazonian sites. * Approximate values.

Site of study	Effort in days (number of researchers)	Richness			References
		Butterflies	Riodinidae	<i>Symmachia</i>	
North Portion of the PNSD, Acre, Brazil	9(1)	411 spp	163 spp	15 spp	Present study
Parque Estadual do Chandless, Acre, Brazil	14(2)	482 spp	83 spp	0 spp	Mielke et al. (2010)
Reserva Tambopata, Madre de Dios, Peru	76(>2)*	1234 spp	239 spp	4 spp	Lamas (1994)
Parque Nacional del Manu, Pakitza, Peru	97(>2)*	1300 spp	246 spp	5 spp	Robbins et al. (1996)
Cacaulândia, Rondônia, Brazil	200(>2)*	1592 spp	345 spp	8 spp	Austin et al. (unpublished)

***Symmachia tricolor* Hewitson, 1867**

(Fig. 37-38, 55)

Six individuals of this species were captured after 14:30h on the hilltop. It is the only species of the genus for which females were collected (n=2). The specimens were collected in a small clearing while flying fast at one meter from the ground, when resting on dry branches or above small trees with about three meters high.

Discussion

Located in the northwest region of the state of Acre, on the border with Peru, the PNSD forms the watershed of the middle valley of the Ucayali River, Peru, and Juruá River basin, one of the richest regions in the world for butterflies (Brown and Freitas 2002).

The high richness of *Symmachia* at the PNSD, including a new species, found in only eight days of sampling at the top of a single hill by a single researcher, is surprising, considering the rarity of most species of the genus. In fact, the PNSD has more species of *Symmachia* than any other site with a published list in the western Amazon, even though several of these sites have been intensively collected for consecutive years and have been subject to much greater sampling effort (Lamas 1994; Robbins et al. 1996; Mielke et al. 2010)(Table 1).

It is precisely because of the mountainous topography found at PNSD that access to the rich and little-known canopy-associated butterfly fauna is facilitated, due to the behavior of hilltopping performed by many riodinid species. The rich fauna of butterflies at this site applies not only to the genus *Symmachia*, with a total of approximately 160 Riodinidae species sampled, more than 80% occurring on the top of a single hill. In addition, other groups of insects, such as wasps of the Bethyridae (Hymenoptera), presented high richness in this place, where in a short sampling period more than 100 morphospecies were collected, most of them unknown to science (Azevedo et al. 2002; Azevedo and Batista 2002; Morato et al. 2008). Even the fauna of large mammals found at PNSD places it among the richest protected areas of the Neotropics (Calouro 1999).

More sampling is needed to generate a robust list of butterflies occurring in PNSD, especially in places not yet surveyed, including the tops of other mountains in the region.

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